



NB6 Series Quality of Service (QoS) Setup

(NB6Plus4, NB6Plus4W Rev1)

NB6 Series and Quality of Service (QoS)

The following Quality of Service (QoS) settings offer a basic setup example, setting up 3 devices connecting to an NB6Plus4 router, the first with the highest priority QoS priority data traffic for a VoIP ATA, the second with medium priority QoS priority data traffic flow for a gaming console and the third with low priority QoS priority data traffic flow. All other data packet traffic through the router assumes a default best effort setting.

Quality of Service refers to the reservation of bandwidth resources on the Nb6 Series router to provide different priorities to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.

In this implementation Quality of Service employs DSCP – Differentiated Services Code Point – a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying, managing network traffic.

This example guide sets up QoS with three devices (VoIP ATA, gaming console and PC) connecting via ethernet cable to an NB6 series router. One device (VoIP ATA) is assigned the highest priority traffic while the second device (gaming console) is assigned a medium priority while the third device (PC) is assigned a low best effort priority. Before Quality of Service can be implemented the first step involves reserving an IP address for each device linking the MAC address of each device to each IP address as shown in step one.

Quality of Service (QoS) Setup: Part 1 Reserve IP addresses

It is necessary to reserve an IP address for a device that is connecting to the NB6 Series router so that the QoS settings can manage each device and set data packet traffic priority by MAC and IP address.

1. Navigate to <http://192.168.1.1> in a web browser.
2. Enter 'admin' (without quotes) for both the username and password and click Ok.
3. Select **Advanced** > **Local Network** > **DHCP Server**.

NetComm Quick Start | Status | **Advanced** | Management

Language: English

Local Network
IP Address
DHCP Server
UPnP
IGMP Snooping
Internet
IP Routing
Virtual Server
NAT ALG
Firewall
Quality of Service
Port Mapping

DHCP Server Configuration

Enabling DHCP Server on LAN interface can provide the proper IP address settings to your computer.

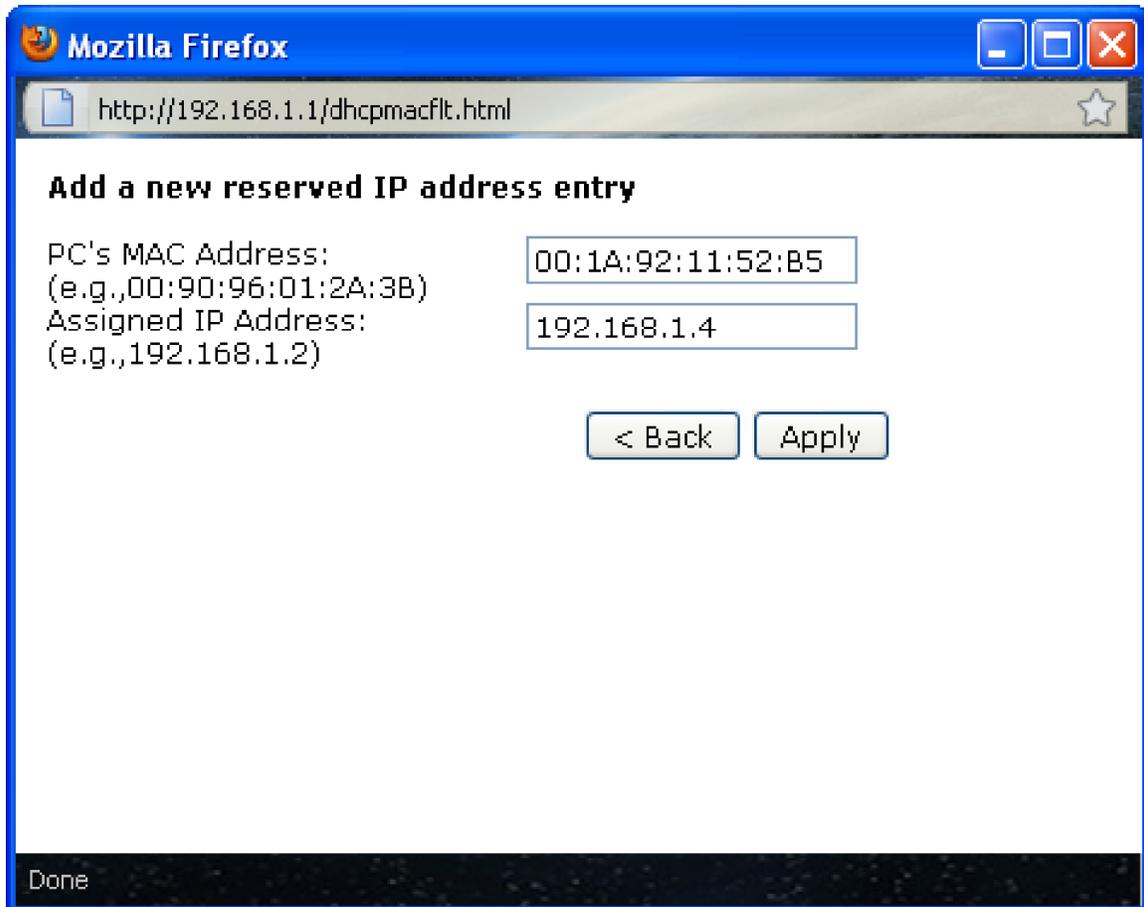
DHCP Server On Start IP: 192.168.1.2
End IP: 192.168.1.254
Lease Time: 1 days 0 hours 0 minutes
Reserved IP Address List

Relay On Relay to Server IP: 192.168.1.2
 Server and Relay Off

New settings only take effect after the router is rebooted. If necessary, reconfigure your PC's IP address to match new settings.

Firmware: 3.64y
ADSL2+: A2pB025c.d20h

4. Press the **Reserved IP Address List**.



The screenshot shows a Mozilla Firefox browser window with the address bar containing `http://192.168.1.1/dhcpmacflt.html`. The main content area displays the title "Add a new reserved IP address entry" and two input fields. The first field is labeled "PC's MAC Address:" with the example "(e.g.,00:90:96:01:2A:3B)" and contains the value "00:1A:92:11:52:B5". The second field is labeled "Assigned IP Address:" with the example "(e.g.,192.168.1.2)" and contains the value "192.168.1.4". Below the input fields are two buttons: "< Back" and "Apply". The status bar at the bottom of the browser window shows the word "Done".

5. Enter the MAC address of the device/PC and the local IP address you wish to reserve for that device. The IP address will be in the range of 192.168.1.x where x is 2 – 254.
6. Press the Apply Button.

7. Complete steps 4 -6 to reserve an IP address for all the devices you wish to employ QoS with.

Reserved IP Address List

You can reserve one specific IP address for a certain PC by adding the mapping entry between MAC address and IP address.

MAC Address	IP Address	Delete
00:1A:92:11:52:B5	192.168.1.4	
00:14:A5:7A:63:EE	192.168.1.6	
70:F1:A1:53:A4:3D	192.168.1.8	

Done

Quality of Service (QoS) Setup: Part 2 Bridge QoS Settings

The following guide shows how to setup 3 devices with QoS to an NB6 Series router, one with high priority QoS settings, one with medium priority QoS settings one with low priority QoS settings.

1. Select **Advanced** > **Quality of Service** > **Bridge QoS**.
2. Press the **Add** button.

The screenshot shows the NetComm router's web interface. The top navigation bar includes 'Quick Start', 'Status', 'Advanced', and 'Management'. The left sidebar lists various settings categories, with 'Quality of Service' expanded to show 'Bridge QoS'. The main content area is titled 'Add New Bridge QoS Traffic Rule' and contains the following configuration fields:

- Traffic Class Name:
- Traffic Conditions: LAN 802.1p Priority:
- Assign Priority for this Traffic Rule: Traffic Priority: ; DiffServ Class (DSCP): . A note explains that the DSCP value will be overwritten by the selected value.
- WAN 802.1p: . A note explains that if 802.1q VLAN tagging is enabled, the WAN 802.1p value can be overwritten.

Buttons for '< Back' and 'Apply' are visible at the bottom of the configuration area. A warning message at the bottom left states: 'WARNING: Router's settings are changed. New settings are only valid after restarting router.'

3. Enter a **Traffic Class Name** as **High_Priority**.
4. Enter the **LAN 802.1p Priority** as **5**.
5. Set the **Traffic Priority** as **High**.
6. Set the **Differentiated Service Code Point (DSCP)** as **EF – 0xB8**. EF stands for Expedited Forwarding.
7. Set the **WAN 802.1p** as **5** and press **Apply**.

8. Select **Advanced** > **Quality of Service** > **Bridge QoS**.
9. Press the **Add** button.

The screenshot shows the NetComm router's web interface. At the top, there is a navigation bar with the NetComm logo and menu items: Quick Start, Status, Advanced (selected), and Management. A language dropdown menu is set to English. On the left, a sidebar menu lists various settings: Local Network, Internet, IP Routing, Virtual Server, NAT ALG, Firewall, Quality of Service (selected), Bridge QoS (selected), IP QoS, and Port Mapping. The main content area is titled 'Add New Bridge QoS Traffic Rule' and contains the following configuration fields:

- Traffic Class Name:
- Traffic Conditions: LAN 802.1p Priority:
- Assign Priority for this Traffic Rule: Traffic Priority: ; DiffServ Class (DSCP): ; WAN 802.1p:

Below the fields are '< Back' and 'Apply' buttons. A warning message at the bottom of the interface reads: 'WARNING: Router's settings are changed. New settings are only valid after restarting router.'

10. Enter the **Traffic Class Name** as **Medium_Priority**.
11. Set the **LAN 802.1p Priority** as **3**.
12. Enter the **Traffic Priority** as **Medium**.
13. Set the **Differentiated Service Code Point (DSCP)** as **AF32 – 0x70**. AF stands for Assured Forwarding.
14. Set the **WAN 802.1p** as **3**.
15. Press **Apply**.

16. Select **Advanced** > **Quality of Service** > **Bridge QoS**.

17. Press the **Add** button.

The screenshot shows the NetComm web interface. At the top, there is a navigation bar with icons for Quick Start, Status, Advanced, and Management. The 'Advanced' icon is highlighted. Below the navigation bar, there is a language dropdown menu set to 'English'. On the left side, there is a sidebar menu with the following items: Local Network, Internet, IP Routing, Virtual Server, NAT ALG, Firewall, Quality of Service, Bridge QoS, IP QoS, and Port Mapping. The 'Quality of Service' menu item is expanded, and the 'Bridge QoS' sub-item is selected. The main content area is titled 'Add New Bridge QoS Traffic Rule'. It contains the following fields and options:

- Traffic Class Name:
- Traffic Conditions: LAN 802.1p Priority:
- Assign Priority for this Traffic Rule:
 - Traffic Priority:
 - DiffServ Class (DSCP):
 - WAN 802.1p:

There are two buttons at the bottom: '< Back' and 'Apply'. On the right side of the 'Assign Priority' section, there is explanatory text: 'The corresponding DSCP value in the IP header of the upstream packets will be overwritten by selected value. If 802.1q VLAN tagging is enabled on Internet connection, WAN 802.1p value of the upstream packets can be overwritten by selected value.'

At the bottom of the page, there is a status bar with a globe icon and the text 'Internet'.

18. Enter the **Traffic Class Name** as **Low_Priority**.

19. Set the **LAN 802.1p Priority** as **0**.

20. Set the **Traffic Priority** as **Low**.

21. Set the **Differentiated Service Code Point (DSCP)** as **AF11 – 0x38**.

22. Set the **WAN 802.1p** as **0**.

23. Press **Apply**.

24. You should now have 3 Bridge QoS entries as shown in the screenshot below.

The screenshot shows the NetComm router web interface. At the top, there is a navigation menu with icons for Quick Start, Status, Advanced (highlighted), and Management. The language is set to English. On the left, a sidebar lists various configuration options: Local Network, Internet, IP Routing, Virtual Server, NAT ALG, Firewall, Quality of Service (with Bridge QoS selected), and Port Mapping. The main content area is titled "Bridge QoS" and contains a descriptive paragraph and a table of three entries. Below the table are "Select All" and "Add/Delete" buttons. The bottom status bar shows "Done" and "Internet".

Bridge QoS

This page allows you to classify the upstream traffic (to the Internet) by assigning the transmission priority for various user data. Bridge QoS function prioritizes the data transmission based on layer 2 bridge packets.

Traffic Name	Traffic Priority			Traffic Conditions	
	Priority	DiffServ Class	WAN 802.1p	LAN 802.1p	Delete
High_Priority	High	EF - 0xB8	5	5	<input type="checkbox"/>
Medium_Priority	Medium	AF32 - 0x70	3	3	<input type="checkbox"/>
Low_Priority	Low	AF11 - 0x28	0	0	<input type="checkbox"/>

Select All

Firmware: 3.64y
ADSL2+ : A2pB025c.d20h

Done Internet

Quality of Service (QoS) Setup: Part 3 IP QoS Settings

The following guide is an example only. The following example gives QoS settings for three devices, one a VoIP ATA with High Priority QoS settings, one a gaming console with Medium Priority QoS settings and one a PC with Low Priority QoS settings.

1. Select **Advanced** > **Quality of Service** > **IP QoS**.
2. Press the **Add** button.

The screenshot shows the NetComm router's web interface. At the top, there is a navigation menu with icons for Quick Start, Status, Advanced (selected), and Management. The language is set to English. On the left, a sidebar menu lists various settings: Local Network, Internet, IP Routing, Virtual Server, NAT ALG, Firewall, Quality of Service (selected), Bridge QoS, IP QoS, and Port Mapping. The main content area is titled "Add New IP QoS Traffic Rule". It contains several sections: "Traffic Conditions" with fields for Traffic Class Name (VoIP_ATA_High_Priority_QoS), LAN Ports (checked for Ethernet), Source and Destination MAC addresses, Protocol (TCP/UDP), Source and Destination IP addresses with Subnet Masks, and Source and Destination Port ranges. "Assign Priority for this Traffic Rule" section includes Traffic Priority (High), DiffServ Class (DSCP) (EF-0xB8), and WAN 802.1p (5). A warning message at the bottom left states: "WARNING: Router's settings are changed. New settings are only valid after restarting router." At the bottom of the main area are "Back" and "Apply" buttons. The status bar at the very bottom shows "Done".

Local Network
Internet
IP Routing
Virtual Server
NAT ALG
Firewall
Quality of Service
 Bridge QoS
 IP QoS
 Port Mapping

Firmware: 3.64y
ADSL2+ : A2p8025c.d20h

WARNING:
Router's settings are changed. New settings are only valid after restarting router.

Done

High Priority QoS Device Settings

3. Enter a **Traffic Class Name** to reflect the high Priority such as **VoIP_ATA_High_Priority_QoS**.
4. Select the **LAN Ports which traffic come from** as **Ethernet**
5. Enter the **Source MAC address** of the device you are connecting to the NB6 Series router. Enter the 12 character MAC address with a colon (:) between every two characters. In the example above the MAC address is **00:1A:92:11:52:B5**.
6. Enter the **Source MAC Mask** if you know it. If not leave this field blank.
7. Enter the **Destination MAC Address** if the destination is to a single device. If you require the Destination MAC address to be any device or MAC address leave this field blank.
8. Enter the **Destination MAC Mask** of the destination MAC address if required.
9. Enter the default **Protocol** as TCP/UDP if you are unsure of which protocol to use. Other options include TCP, UDP and ICMP.
10. Enter the **Source IP address** being the local IP address assigned to the device. In this example the high priority device is assigned 192.168.1.4.
11. Enter the **Source Subnet Mask** as 255.255.255.0.
12. Enter the **Destination IP address** if the address is for a single server or subnet. If you require the destination address to be any address leave the field blank.
13. Enter the **Destination Subnet Mask** if you have entered a Destination IP address. If not leave this field blank.
14. Enter the **Destination Port Start - End** port(s). If the port number is a single port number enter the same port number in both fields.
15. Set the **Traffic Priority** to High.
16. Set the **Differentiated Service Code Point (DSCP)** to **EF – 0xB8**.
17. Set the **WAN 802.1p** to 5.
18. Press **Apply**.

Medium Priority QoS Device Settings

19. Select **Advanced** > **Quality of Service** > **IP QoS**.

20. Press the **Add** button.

NetComm

Quick Start | Status | **Advanced** | Management

Language: English

Local Network

Internet

IP Routing

Virtual Server

NAT ALG

Firewall

Quality of Service

Bridge QoS

IP QoS

Port Mapping

Add New IP QoS Traffic Rule

All of specified conditions in the traffic rule must be satisfied for the rule to take effect.

Traffic Class Name:

Traffic Conditions

LAN Ports which traffic come from: Ethernet

Source MAC Address: MAC Mask:

Destination MAC Address: MAC Mask:

Protocol:

Source IP Address: Subnet Mask:

Source Port (Start-End): -

Destination IP Address: Subnet Mask:

Destination Port(Start-End): -

Assign Priority for this Traffic Rule

Traffic Priority:

DiffServ Class (DSCP): The corresponding DSCP value in the IP header of the upstream packets will be overwritten by selected value.

WAN 802.1p: If 802.1q VLAN tagging is enabled on Internet connection, WAN 802.1p value of the upstream packets can be overwritten by selected value.

Firmware: 3.64y
ADSL2+: A2pB025c.d20h

WARNING:
Router's settings are changed. New settings are only valid after restarting router.

Done

1. Enter a **Traffic Class Name** for the medium priority device, in this example it is named Xbox360_Medium_Priority_QoS.
2. Select the **LAN Ports which traffic come from** as **Ethernet**.
3. Enter the **Source MAC address** of the device you are connecting to the NB6 Series router. Enter the 12 character MAC address with a colon (:) between every two characters. In the example above the MAC address is **00:14:A5:7A:63:EE**.
4. Enter the **Source MAC Mask** if required. If not required or if you are unsure leave this field blank.
5. Enter the **Destination MAC Address** if the destination is to a single device. If you require the Destination MAC address to be any device or MAC address leave this field blank.
6. Enter the **Destination MAC Mask** of the destination MAC address if required. If not required or if you are unsure leave this field blank.
7. Enter the default **Protocol** as TCP/UDP if you are unsure of which protocol to use. Other options include TCP, UDP and ICMP.
8. Enter the **Source IP address** being the local IP address assigned to the device. In this example the medium priority device is assigned 192.168.1.6.
9. Enter the **Source Subnet Mask** as 255.255.255.0.
10. Enter the **Destination IP address** if the address is for a single server or subnet. If you require the destination address to be any address leave the field blank.
11. Enter the **Destination Subnet Mask** if you have entered a Destination IP address. If not leave this field blank.
12. Enter the **Destination Port Start - End** port(s). If the port number is a single port number enter the same port number in both fields.
13. Set the **Traffic Priority** to Medium.
14. Set the **Differentiated Service Code Point (DSCP)** to **AF32 – 0x70**.
15. Set the **WAN 802.1p** to 3.
16. Press **Apply**.

Low Priority QoS Device Settings

17. Select **Advanced** > **Quality of Service** > **IP QoS**.

18. Press the **Add** button.

The screenshot shows the NetComm router's web interface. At the top, there is a navigation bar with icons for Quick Start, Status, Advanced (selected), and Management. The language is set to English. On the left, a sidebar menu lists various configuration options: Local Network, Internet, IP Routing, Virtual Server, NAT ALG, Firewall, Quality of Service (selected), Bridge QoS, IP QoS (selected), and Port Mapping. The main content area is titled "Add New IP QoS Traffic Rule". It contains the following fields and options:

- Traffic Class Name:** PC_Low_Priority_QoS
- Traffic Conditions:**
 - LAN Ports which traffic come from: Ethernet
 - Source MAC Address: 70:F1:A1:53:A4:3 | MAC Mask: []
 - Destination MAC Address: [] | MAC Mask: []
 - Protocol: TCP/UDP
 - Source IP Address: 192.168.1.8 | Subnet Mask: 255.255.255.0
 - Source Port (Start-End): [] - []
 - Destination IP Address: [] | Subnet Mask: []
 - Destination Port(Start-End): [] - []
- Assign Priority for this Traffic Rule:**
 - Traffic Priority: Low
 - DiffServ Class (DSCP): AF11 - 0x28 (Note: The corresponding DSCP value in the IP header of the upstream packets will be overwritten by selected value.)
 - WAN 802.1q: 0 (Note: If 802.1q VLAN tagging is enabled on Internet connection, WAN 802.1q value of the upstream packets can be overwritten by selected value.)

At the bottom of the form, there are buttons for "< Back" and "Apply". The status bar at the very bottom of the page shows "Done".

19. Enter a **Traffic Class Name** for the medium priority device, in this example it is named PC_Low_Priority_QoS.
20. Select the **LAN Ports which traffic come from** as **Ethernet**.
21. Enter the **Source MAC address** of the device you are connecting to the NB6 Series router. Enter the 12 character MAC address with a colon (:) between every two characters. In the example above the MAC address is **70:F1:A1:53:A4:3D**
22. Enter the **Source MAC Mask** if required. If not required or if you are unsure leave this field blank.
23. Enter the **Destination MAC Address** if the destination is to a single device. If you require the Destination MAC address to be any device or MAC address leave this field blank.
24. Enter the **Destination MAC Mask** of the destination MAC address if required. If not required or if you are unsure leave this field blank.
25. Enter the default **Protocol** as **TCP/UDP** if you are unsure of which protocol to use. Other options include TCP, UDP and ICMP.
26. Enter the **Source IP address** being the local IP address assigned to the device. In this example the low priority device is assigned **192.168.1.8**.
27. Enter the **Source Subnet Mask** as **255.255.255.0**.
28. Enter the **Destination IP address** if the address is for a single server or subnet. If you require the destination address to be any address leave the field blank.
29. Enter the **Destination Subnet Mask** if you have entered a Destination IP address. If not leave this field blank.
30. Enter the **Destination Port Start - End** port(s). If the port number is a single port number enter the same port number in both fields.
31. Set the **Traffic Priority** to Medium.
32. Set the **Differentiated Service Code Point (DSCP)** to **AF11- 0x38**.
33. Set the **WAN 802.1p** to 0.
34. Press **Apply**.

IP QoS Summary

The IP QoS page should resemble the screenshot below with each QoS rule added for each device connecting to the NBPlus4, set with priority High, Medium and Low.

35. Select Management > Reset Router and press the reboot button to save the new QoS settings.

NetComm Quick Start | Status | **Advanced** | Management

Language: English

Local Network
Internet
IP Routing
Virtual Server
NAT ALG
Firewall
Quality of Service
 Bridge QoS
 IP QoS
 Port Mapping

Firmware: 3.64y
ADSL2+: A2pB025c.d20h

IP QoS

This page allows you to classify the upstream traffic (to the Internet) by assigning the transmission priority for various user data. IP QoS function prioritizes the data transmission based on layer 3 IP packets.

Traffic Name	Traffic Priority			Traffic Conditions					Delete	
	Priority	DiffServ Class	WAN 802.1p	LAN Ports	Source MAC addr	Dest MAC addr	Protocol	Source IP Source Port		Dest IP Dest Port
VoIP_ATA_High_Priority_QoS	High	EF - 0x88	5	Ethernet	00:1a:92:11:52:b5	All	TCP/UDP	192.168.1.4/ 255.255.255.0 5060-5061	All All	<input type="checkbox"/>
Xbox360_Medium_Priority_QoS	Medium	AF32 - 0x70	3	Ethernet	00:14:a5:7a:63:ee	All	TCP/UDP	192.168.1.6/ 255.255.255.0 3200-4000	All All	<input type="checkbox"/>
PC_Low_Priority_QoS	Low	AF11 - 0x28	0	Ethernet	70:f1:a1:53:a4:3d	All	TCP/UDP	192.168.1.8/ 255.255.255.0 All	All All	<input type="checkbox"/>

Select All

Add Delete

Done Internet